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RESEARCH HIGHLIGHTS

Many deaths attributed to natural causes during the COVID-19 pandemic may have instead been due to the virus

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Behavioral & Social Research COVID-19 Demography

Several studies have found that mortality increased at the beginning of the COVID-19 pandemic. While many of these excess deaths — higher than would be expected based on mortality patterns in earlier times — during the first 30 months of the pandemic were officially linked to COVID-19, a substantial number were reported as other natural causes. The timing suggests that many of these deaths could have been unrecognized COVID-19 fatalities or indirectly linked to pandemic-related disruptions in health care and society. Findings from an NIA-funded study exploring this question were published in *PNAS*.

To understand how COVID-19 death counts reflect the true impact of the pandemic, a team led by scientists from the University of Pennsylvania, Boston University, and collaborative institutions studied excess mortality from natural causes, i.e., diseases and chronic conditions. Calculations of excess mortality are used to measure the impact of COVID-19 on deaths. Between March 2020 and August 2022, the U.S. had nearly 1.2 million more deaths than expected, with approximately 635,000 in the first year and 544,000 in the second year. Previous studies found that these excess deaths were higher than the reported COVID-19 deaths, but most of that earlier research investigated extra deaths from *all* causes. In this new study, the scientists focused on natural causes of death, which may provide a better estimate of unacknowledged COVID-19 deaths.

The researchers employed innovative statistical techniques to examine monthly Centers for Disease Control and Prevention data on natural-cause deaths and reported COVID-19 fatalities across 3,127 counties spanning the first 30 months of the pandemic, March 2020 to August 2022. Their analysis revealed approximately 1.2 million

more natural-cause deaths than expected during this period. Of these deaths, nearly 163,000 did not have a COVID-19 notation on their death certificates. The largest gaps between these excess deaths and reported COVID-19 deaths were in rural areas, the West, and the South.

Increases in reported COVID-19 deaths often coincided with increases in excess natural-cause deaths, but many of the natural-cause ones were likely unrecognized COVID-19 deaths. The correlation between COVID-19 deaths and excess natural-cause deaths suggests that health care delays and social and economic impacts of the pandemic were not the main reasons for these excess deaths. For example, in areas where a greater proportion of excess deaths were assigned to natural causes, there may have been more unrecognized COVID-19 deaths due to less testing, more deaths outside hospitals, and less experienced death investigators. Some areas, such as New England and the mid-Atlantic metropolitan counties, had fewer excess natural-cause deaths compared to reported COVID-19 deaths, possibly due to declines in other causes of death (influenza, for example) due to COVID prevention policies and greater ability to work from home in some more economically privileged counties, or different reporting standards.

Limitations of the study include the inability to know for certain if the excess natural-cause deaths were due to unrecognized COVID-19 cases or were related to health care interruptions and social and economic impacts from the pandemic. In addition, while death counts were final for 2020 and 2021, the data for 2022 was still provisional. Future research should differentiate unrecognized COVID-19 deaths from other causes and examine the differences based on individual factors, such as age, gender, race, and socioeconomic status, as well as access to health insurance and primary care. Overall, this study helps improve understanding of the pandemic's true impact and may guide better public health responses and improvements in death investigation systems.

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Reference: Paglino E, et al. Excess natural-cause mortality in US counties and its association with reported COVID-19 deaths. *Proceedings of the National Academies of Science.* 2024. Epub Feb. 1. doi:10.1073/pnas.2313661121.

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